REVIEWS OF BOOKS

HUMAN EVOLUTION

Howell, F. Clark and **Bourlière, François** (Editors). *African Ecology and Human Evolution.* (Wenner-Gren Foundation symposium). London, 1964. Methuen, Pp. viii + 666. Price 84s.

Washburn, Sherwood, L. (Editor). *Classification and Human Evolution.* (Wenner-Gren Foundation symposium). London, 1964. Methuen. Pp. viii + 371. Price 63s.

THESE IMPORTANT BOOKS are the result of two separate symposia of specialists who met at Burg Wartenstein, the European conference centre of the Wenner-Gren Foundation for Anthropological Research. Both works live up to the high standard already set by previous volumes in this series, and I predict that they will be very useful reference works for many years to come. The marked difference in price is due, no doubt, to the size difference, which in turn was dictated to some degree by the fact that in the ecology volume there is an additional hundred pages of discussion. I must admit that this appeared to me to be a long-drawn-out extravagance, and certainly the other monograph is just as useful without it.

In view of the obvious importance of Africa in hominid evolution, and the vast amount of Pleistocene information which is flooding from this continent, it is very satisfactory to have, considered within the same cover, Pleistocene stratigraphy, climatic changes, faunal and floral variations, and early hominids and their cultural associations. For good measure are also chapters on baboon and gorilla ecology—in so far as such studies can help in understanding human evolution. The work is very well endowed with tables and maps, but few illustrations are included—which is a pity as they could have been put to good use in parts.

As the title of the second monograph implies, it is specifically concerned with problems of classifying. At first sight, the subject may appear somewhat dry and narrow in scope, but the breadth of the papers demonstrates nicely how varied is the evidence which must be considered if hominid taxonomic relationships are ever to be resolved with general agreement. Included in this study are contributions on taxonomic "theory"; age, sex and variability in primates; skull, hands and feet in primates; the status of *Oreopithecus*; hominid locomotor functions; behaviour; hominoid chromosomes; and biochemical problems. On the whole I found this a more compact and readable work than the ecology monograph. Both, however, will certainly become established reference works.

DON BROTHWELL

GENETICS

Meier, Hans. *Experimental Pharmacogenetics: Physiopathology of Heredity and Pharmacological Responses.* New York and London, 1963. Academic Press. Pp. xi + 213. Price 60s.

EXAMPLES OF GENETICALLY controlled differences between animals in response to drugs have been known for many years. Recently, interest in these phenomena has considerably increased, and the name "Pharmacogenetics" has been coined for this field. Within the last year or so, several symposia on pharmacogenetics have been held, and there have been several books. The volume under review, though it comes from the Jackson Laboratory, Bar Harbor, Maine, U.S.A., deals by no means only with the mouse, but includes a good deal of information on rats, hamsters, rabbits, guinea pigs, dogs and cats. As the author says in the preface, ". . . this monograph, while primarily addressing itself to research workers in pharmacology and genetics, may be of interest to investigators of problems in physiology, pathology, and biochemistry as well. In fact, because of the complexity of the subject, it has been necessary to assume on the part of the reader considerable familiarity with all of these disciplines. It is hoped, however, that this will not discourage those whose backgrounds in any of these areas are minimal." The reviewer, who cannot claim considerable familiarity with all of these disciplines, has found the book heavy going, not least because of the condensed style of writing and the amount of disconnected factual

detail. However, in the present state of the subject, this is perhaps unavoidable, and we have to be grateful to the author for having brought together this mass of information scattered over many journals not usually consulted by the geneticist.

H. GRÜNEBERG

BIOCHEMISTRY

Mann, Thaddeus. *Biochemistry of Semen and of the Male Reproductive Tract.* Second edition. London, 1964. Methuen. Pp. xxiii + 493. Price 105s.

BERZELIUS, WRITING TO congratulate Wöhler on the synthesis of urea, suggested an extension of the synthetic programme: "Sollte es nun gelingen noch etwas weiter in Productionsvermögen zu kommen (*vesiculae seminales* liegen ja weiter nach vorn als die Urinblase), welche herrliche Kunst in Laborium der Gewerbeschule ein noch so kleines Kind zu machen." Synthesis of a homunculus was an old alchemical project in which few claimed success. We now know enough of the morphological complexity of sperm, let alone the zygote, to regard the project as even less probable than it seemed 136 years ago. Seminal plasma, on the other hand, seemed at one time to be a fluid that could be constructed, or at least simulated, artificially, and work on the problem was an obviously essential step towards trustworthy techniques for the artificial insemination of women and animals. In this second edition Dr. Mann shows how complex the problem is and the rate at which knowledge accumulates; the book has become three times bigger and the references have doubled to well over 2,000.

Far from being a simple medium that merely acts as a vehicle for conveying sperm into the female, seminal plasma turns out to be an active metabolic system in which, as the years go by, more and more enzymes are found. This makes it a happy hunting ground for teleologists. Some of these systems need refined methods for their detection but others are easily observed. Aristotle noticed that semen was at first fluid but quickly coagulated and liquefied again soon afterwards. He commented that the second phase was peculiar because things generally get more fluid when they are heated rather than cooled, but he was not sufficiently given to experiment to observe that semen does not coagulate again on reheating. He is, however, entitled to some credit for enzymic prescience, for he likened the mode of action of semen to that of fig juice or rennet in clotting milk. Seminal coagulation resembles, in some ways, blood-clotting—it comes about when a prostatic enzyme meets vesicular protein—but the latter is not clotted by thrombin nor is the former able to clot fibrinogen. We have here yet another example of what seems to be a common biological phenomenon: what appears to be the same physical problem, the production of a clot in this case, is solved by different biochemical methods not only in different species but even in different parts of one species. Semen also contains a battery of peptidases, phosphatases, nucleases and other enzymes; they are all interesting and none of them have, as yet, any obvious function.

Much of the book is devoted to an account of these enzyme systems and it is an admirable liberal education in general biochemistry. It is no criticism to add that those who have not learnt much biochemistry may find it difficult in places unless they have an ordinary textbook at hand. The extraordinary diversity of sperm morphology has long been known; animals could indeed be fairly precisely identified by their sperm alone. There is as great diversity in the chemical composition of semen. The number of species so far examined is too small for any attempt at generalization to be profitable, but it is already clear that the distribution of such components as citrate, ergothionine, fructose, inositol, sorbitol and spermine makes no sort of phylogenetic sense. Like the enzymes, most of these substances have no known function.

The sections of the book most relevant to eugenics deal with the factors that contribute to the fertilizing capacity of sperm, to their survival *in vitro* so as to make artificial insemination effective, and to their inhibition either before or after discharge so as to make contraception trustworthy. On all these themes Mann is lucid and informative. He describes attempts to separate X- from Y-bearing sperm, the composition and merits of different sperm diluents, the effects of nutrition and metabolic poisons on